## Adoptive transfer of induced-treg cells effectively attenuates murine airway allergic inflammation.

**Journal:** PLoS One

**Publication Year:** 2012

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**PubMed link:** 22792275

**Funding Grants:** CHLA Stem Cell Training Grant

**Public Summary:**
Both nature and induced regulatory T (Treg) lymphocytes are potent regulators of autoimmune and allergic disorders. Defects in endogenous Treg cells have been reported in patients with allergic asthma, suggesting that disrupted Treg cellmediated immunological regulation may play an important role in airway allergic inflammation. In order to determine whether adoptive transfer of induced Treg cells generated in vitro can be used as an effective therapeutic approach to suppress airway allergic inflammation, exogenously induced Treg cells were infused into ovalbumin-sensitized mice prior to or during intranasal ovalbumin challenge. The results showed that adoptive transfer of induced Treg cells prior to allergen challenge markedly reduced airway hyperresponsiveness, eosinophil recruitment, mucus hyper-production, airway remodeling, and IgE levels. This effect was associated with increase of Treg cells (CD4+FoxP3+) and decrease of dendritic cells in the draining lymph nodes, and with reduction of Th1, Th2, and Th17 cell response as compared to the controls. Moreover, adoptive transfer of induced Treg cells during allergen challenge also effectively attenuate airway inflammation and improve airway function, which are comparable to those by natural Treg cell infusion. Therefore, adoptive transfer of in vitro induced Treg cells may be a promising therapeutic approach to prevent and treat severe asthma.

**Scientific Abstract:**
Both nature and induced regulatory T (Treg) lymphocytes are potent regulators of autoimmune and allergic disorders. Defects in endogenous Treg cells have been reported in patients with allergic asthma, suggesting that disrupted Treg cell-mediated immunological regulation may play an important role in airway allergic inflammation. In order to determine whether adoptive transfer of induced Treg cells generated in vitro can be used as an effective therapeutic approach to suppress airway allergic inflammation, exogenously induced Treg cells were infused into ovalbumin-sensitized mice prior to or during intranasal ovalbumin challenge. The results showed that adoptive transfer of induced Treg cells prior to allergen challenge markedly reduced airway hyperresponsiveness, eosinophil recruitment, mucus hyper-production, airway remodeling, and IgE levels. This effect was associated with increase of Treg cells (CD4(+)FoxP3(+)) and decrease of dendritic cells in the draining lymph nodes, and with reduction of Th1, Th2, and Th17 cell response as compared to the controls. Moreover, adoptive transfer of induced Treg cells during allergen challenge also effectively attenuate airway inflammation and improve airway function, which are comparable to those by natural Treg cell infusion. Therefore, adoptive transfer of in vitro induced Treg cells may be a promising therapeutic approach to prevent and treat severe asthma.